The Yuma Mesa, Arizona

Washington, D.C.
1919

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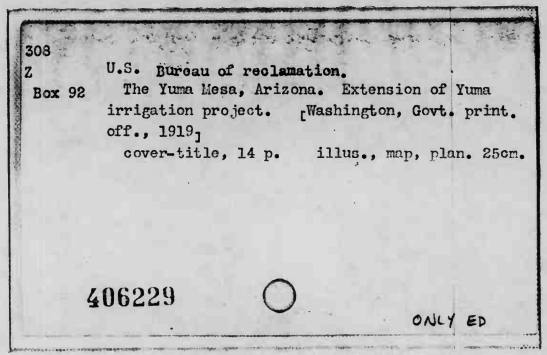
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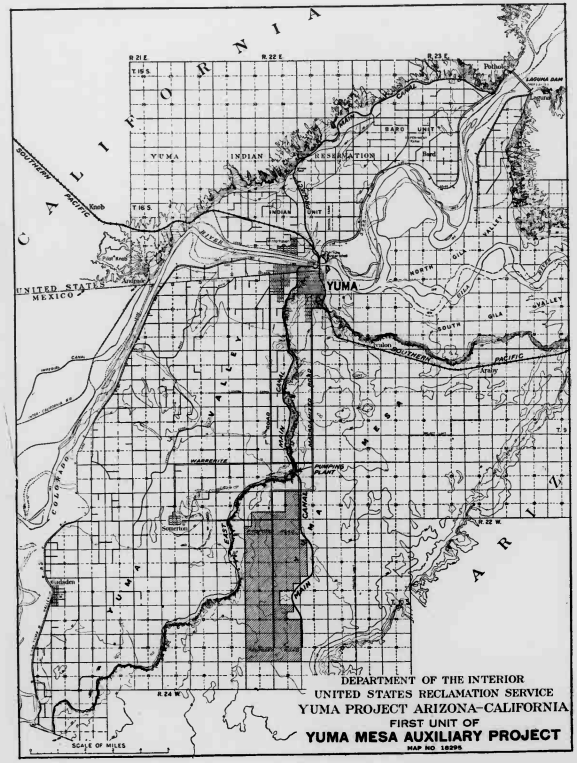
THE YUMA MESA

ARIZONA

Extension of Yuma Irrigation Project

ORANGE GROVE WITH FAN PALM IN FOREGROUND

U. S. Reclamation Service



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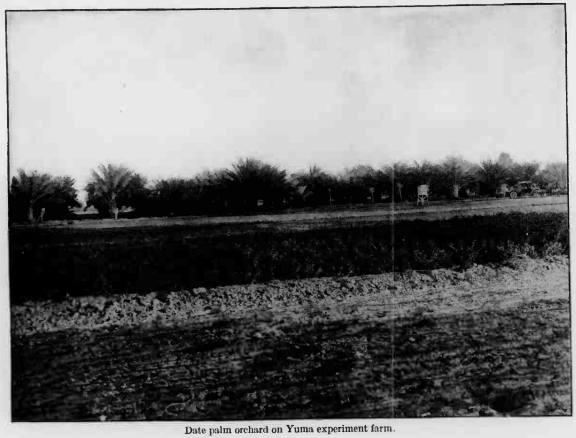

Date palm orchard on Yuma experiment farm.

Deglet Noor date tree, Yuma project.

Palm bordered orange groves on Yuma Mesa.

GOVERNMENT TO SELL 500 FARMS.

YUMA, ARIZ., WILL BE THE SCENE OF UNIQUE AUCTION SALE.

The first unit of the Yuma Mesa containing about 6,400 acres of public land has been platted and subdivided into about 500 farms, ranging from 5 to 20 acres each. The Secretary of the Interior has ordered the sale of these farms to the highest bidders, and bids will be received by public outcry at Sunset Park, in the city of Yuma, Ariz., on and after December 10, 1919. The sale is made under the terms of the act of January 25, 1917, which is printed elsewhere. Terms and conditions of the sale and requirements as to residence are given in the "Public notice" appended hereto.

MINIMUM PRICE OF LAND AND WATER RIGHT.

The minimum price is $225 per acre, of which $200 is the estimated cost of the irrigation works. The appraised value of the dry land has been designated by the Secretary of the Interior, as required by law, as $25. No bids for less than the sum of the estimated cost of the works and the appraised value of the land, or $225 per acre, will be accepted, and the successful bidder must make a deposit representing 10 per cent of the amount bid. For further particulars as to limit of each individual bidding, see the "Public notice" appended hereto.

LOCATION AND DESCRIPTION OF LANDS.

The Yuma Mesa occupies a portion of the Colorado desert lying south of the Gila Valley between the Yuma Valley and the mountains some miles to the east. It extends from the city of Yuma south across the international boundary into Mexico, and consists of a series of relatively regular and level terraces rising by steps to the east. The lower terrace within the boundary of the United States covers about 50,000 acres, which is generally considered an integral part of the Yuma reclamation project now in operation for the Reservation and Yuma Valley lands in California and Arizona. The elevation of the mesa is between 125 and 210 feet above sea level, the higher elevations being on the north, with slopes toward the west and south. In general the mesa has sufficient slope from east to west and from north to south to give excellent natural surface drainage for all except a few depressions which may require an artificial outlet. These depressions have been eliminated from the first unit of the project. Owing to the smooth character of the lands ,the cost of leveling will be comparatively low.

On the mesa are two rock uplifts from which excellent road-making material is available and is being secured.

SOILS OF THE MESA.

Careful investigation of the soils, crops, and climate of the meas has been made on two occasions by the following: A commission from the University of Arizona, composed of Prof. A. E. Vinson, agricultural chemist; G. E. Thompson, agronomist, and F. J. Crider, horticulturist, January, 1919; and by Prof. Charles F. Shaw, Division of Soil Technology, University of California, May, 1919.

These investigations were ertirely separate and independent, and were undertaken for the Reclamation Service by the University of Arizona and by the University of California for the purpose of securing expert information for the benefit of the intending purchasers. From these reports the following important and interesting extracts have been made, lack of space not permitting the insertion of the reports entire. Copies of the reports are on file in the Yuma office, and may be examined by intending purchasers.

The Yuma Mesa undoubtedly is of marine origin, and, in common with marine soils, it does not contain a large total amount of organic plant-food elements. In general, the soil is a fine sand of uniform texture, and its most striking characteristic is its highly calcareous nature. When dry, the sand is easily sifted, but when wet it resembles sandy loam. In color the soil varies from gray to reddish gray and reddish brown. Only a small amount of clay or silt occurs in the entire area. The loamy appearance of the soil apparently is due to the presence of a large amount of lime, which occurs as a thin deposit on the soil grains and has a marked effect on the structure of the soil. Associated with the calcareous incrustation occurs a considerable part of the phosphorus and potassium found in the soil, which would account for the ready availability of the mineral plant foods present. Numerous borings failed to discover hardpan anywhere on the mesa. Analysis of the soils disclosed but little alkali, and with ordinary good methods of irrigation and cultivation they should not become affected. With the possible exception of

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the depressions, alkali will not be a problem on the mesa.

All the mesa soils are deficient in humus or organic matter, and one of the chief requirements of successful farming will be to supply this lack by green-manuring—plowing down green cover crop. Irrigation from the silt-laden waters of the Colorado will add a considerable amount of nitrogen, potash, and phosphorus, but not enough to make up the deficiency in the soil. The fertilizer needs of these soils would probably be met by light applications of acid phosphate, stable manure, and leguminous cover crops—a relatively inexpensive practice when compared with that in use on other citrus districts. In starting operations it would pay to plan at once on building up the organic matter, devoting the first year or more to growing cover crops and working them into the soil."

CLIMATE.

[Extract from report by members of the staff of the University of Arizona.]

Climate more than anything else has been the determining factor in the location and development of the citrus districts of the world. The physical nature of the soil may be modified, plant food supplied, and water problems solved, but unless a region has the natural and fundamental requirement of climate, it can not become a commercial citrus-producing center. Its climate is unique among the citrus districts of the country, since it has, occurring together, the smallest rainfall, lowest relative humidity, and greatest percentage of sunshine—a combination which makes possible the production of fruit of fine quality, high color, and with an early ripening period. A product of this distinctive excellence wins favor, extra high price, and a permanent place in the market. Furthermore, the fruit can be allowed to remain on the trees until it attains full maturity without fear of competition.

The history of plantings on the mesa show that the navel crop can be placed on the market in November and December. Grapefruit also has at this time a superior quality, which insures a high selling price.

Another climatic feature of importance found on the mesa is immunity from injurious frosts. The tract is composed for the most part of broad table-land with a gentle slope toward the edge of the mesa, which breaks up into numerous wide draws, affording excellent air drainage to the valley below. Coupled with this ideal topography there is an almost constant circulation of air. Observations on the mesa covering a period of 26 years (the age of the oldest citrus planting in this district) show no serious injury from cold. In the disastrous freeze of 1913, when the thermometer in the Southwest was lower than had been known for a period of 60 years, lemon trees on the mesa were only slightly affected. It can, therefore, be stated that the frost hazard, a matter which should receive first consideration in the selection of a location for citrus growing, is a negligible factor in this district, and should give the prospective citrus grower no concern.

The effect of summer heat and strong winds are items that should receive consideration in establishing a citrous planting, but they are not matters that would prove detrimental to citrous growing in this particular locality. While the heat is intense during portions of the summer, proper methods of pruning obviate any serious difficulty from this quarter. Injury from winds has been observed to occur only on the north and west sides, and is easily remedied by planting windbreaks. Two plants that have been found particularly well adapted to this section for the purpose of windbreaks are eucalyptus (*Eucalyptus rudis*) and the evergreen species of tamarisk (*Tamarisk articulata*). The latter is very ornamental and if generally used would form a most attractive feature of the district. Furthermore, it is easily propagated from cuttings, and on the Yuma mesa has made a growth of 25 feet in 18 months, becoming sufficiently large to serve as a windbreak in less than two years from the time of planting.

The rainfall, as shown by the records of the Weather Bureau station at Yuma, is very low, the average precipitation for a period of 30 years being 3.1 inches per annum. There are two periods of precipitation, though neither could be called at all wet. December, January, and February are the wettest months, averaging nearly half an inch of rainfall each. April, May, June, and July are practically without rain, while August usually receives a third to half an inch. September and October are relatively dry. The summers are long and hot. A maximum of 100° or more is reached in April and continues into October, while the minimum for this period rarely drops below 50°.

INSECT AND PLANT-DISEASE PROBLEMS.

[Extract from report by members of the staff of the University of Arizona.]

A feature of the mesa as a citrus district not to be overlooked is its freedom from injurious insect and plant diseases. In older citrus regions the control of these pests is a heavy expense, materially cutting down profits, which serves to emphasize the great economic advantage of a district where these control measures are unnecessary. It can not be hoped that the Yuma Mesa will always be entirely free from such infestation, but with the rigid quarantine against foreign importations that is now being maintained in the State of Arizona it should be a long time before any serious difficulty of this sort arises.

The hot arid climate is in itself a detriment to many of the insects and diseases of the more humid regions. It probably never will be necessary, for instance, for the fruit to be washed to rid it of black smut, scale, and similar discolorations.

TRANSPORTATION.

The city of Yuma, with a present population of about 5,000, lies at the foot of the escarpment at the extreme northern end of the mesa, its most beautiful residence section being located on the mesa. It is a division point on the main line of the Southern Pacific Railroad, which, with its convenient sidings, gives direct communication with the east and with the coast country. The railroad traverses the lands of the Yuma project for a distance of 10 miles. Three branch railroads run out of Yuma. One branch, 12 miles long, runs from Yuma through the Indian Reservation to Laguna Dam. The Inter-California Railroad runs from Yuma to the California-Mexican line at Andrade and on to Calexico and El Centro in the Imperial Valley—a distance of 60 miles. Both these lines are branches of the Southern Pacific Railroad.

A Government-owned railroad runs from Yuma down the Colorado River a distance of 24 miles to the Arizona-Mexican line, following the crest of the Reclamation Service levee. The California-Arizona Railroad, now nearing completion, will run from San Diego, Calif., to El Centro in the Imperial Valley of California.

The main line of the ocean-to-ocean highway runs through the Yuma project for a distance of 10 miles, crossing the Colorado on the new bridge at Yuma. Other ocean-to-ocean highways are contemplated. These highways, being open all the year, will attract tourists during the winter months from all parts of the United States. The county commissioners have begun the construction of macadamized roads from Yuma to and across the lands to be opened for sale.

CROP ADAPTATION.

[Extract from reports of Prof. Chas. F. Shaw, of the University of California, and by members of the staff of the University of Arizona.]

The soils of the mesa (after being developed) are adapted to the production, under irrigation, of almost any crop that will grow under the local climatic conditions. Alfalfa, cotton, barley, wheat, nonsaccharine sorghums, sudan grass, cantaloupes, tomatoes, and similar crops should all do very well on these soils. Citrus and semitropical fruits should do very well. The list includes oranges, lemons, limes, grapefruit, dates, figs, and grapes. Because of the high initial cost of bringing water to the land and the annual cost of keeping up the system and supplying water, it is probable that the field crops could not be grown with financial success. The cost of the land and the water would be too great to permit of profit in producing such crops.

Representative samples of the leading varieties of citrus fruit grown on the mesa have been closely studied and compared with similar varieties of other commercial citrus-growing regions of California and Florida. The following table summarizes the physical analysis of Yuma fruit:

Physical analyses of Yuma citrus fruits.

Variety.	Date of harvest.	Total weight.	Color of rind.	Thickness of rind.	Rind.	Pulp.	Juice.
		Grams.		*Mm.*	*Per cent.*	*Per cent.*	*Per cent.*
Washington navel orange	Nov. 15.	331.8	Rich yellow	4.6	21.9	26.4	51.7
Valencia orange	do.	188.4	Greenish	5.3	18.4	25.2	56.4
Mediterranean sweet orange	do.	147.4	Greenish yellow	4.6	24.9	26.1	49.0
Marsh seedless grapefruit	do.	323.4	Light yellow	6.0	26.6	24.2	49.2
Eureka lemon	do.	134.8	Yellow	1.8	19.3	23.3	57.4
Lisbon lemon	do.	137.2	do.	2.0	17.7	26.5	55.8

Chemical composition of Yuma Mesa citrus fruits.

Variety.	Total weight.	Brix-apparent sugar.	Citric acid.	Cane sugar.	Invert sugar.	Total.
	Grams.		*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Washington navel orange	337.2	12.22	0.57	5.99	4.16	10.15
Valencia orange	187.1	11.88	1.12	4.22	4.38	8.60
Mediterranean sweet orange	143.6	12.02	1.88	3.75	3.66	7.41
Marsh seedless grapefruit	323.4	11.34	2.00	3.68	4.18	7.86
Eureka lemon	147.3	10.17	7.04	.....	.....	.....
Lisbon lemon	143.8	10.19	7.05	.....	.....	.....

The low acid content, together with the high sugar content, establishes a record for sweetness in the navel variety of orange that is unsurpassed. The acidity and juice content of the Eureka and Lisbon varieties of lemon are both as high as could be desired in this fruit.

In summing up the results of both the physical and chemical analyses of the fruits in question, it can be said that the excellent flavor, abundant juice, fine texture of flesh, thinness of rind, high color, earliness of maturity, and freedom from blemishes combine to give it a distinctive excellence of quality, presenting most clearly a unique and enviable advantage which the Yuma mesa possesses as a commercial citrus district.

ORANGES.

The Washington navel, Valencia, and Mediterranean varieties have all produced satisfactory crops on the mesa and could be relied upon under proper methods of culture and irrigation to give good returns; but of the three the Washington navel appears to offer the greatest promise to the commercial grower. Its early shipping season, beginning in the first part of November, allows this variety to be placed on the market in advance of fruit from other citrus districts. The bulk of the crop could be marketed just previous to the holiday season when citrus fruits are in greatest demand. These facts, together with the high quality and

general popularity of the navel, furnish the grower the best advantages of market, and consequently insure for him the highest prices. This variety has been known to produce an average of from five to nine boxes per tree in the old orchard, and during the present season there are a number of individual trees that are giving equally as good yields. Another advantage of the navel is its early bearing habit, as much as 16 finely formed fruit having been produced on 2-year-old trees on the mesa. The Mediterranean sweet has given good results in the old orchard, and its season being a little later than the navel should make it a satisfactory variety.

GRAPEFRUIT.

The Marsh seedless grapefruit, considered the leading commercial variety, has given a good account of itself on the mesa, and promises to become a profitable crop for this district. It is highly enough colored and sufficiently sweet to be placed on the market in November, but as there is no special advantage in seeking out an early market for this fruit, it might be allowed to remain on the tree until in absolutely prime condition (climate offering no obstacles), at which time it is of superior quality and commands a fancy price.

LEMONS.

Both the Eureka and Lisbon varieties of lemon have given splendid yields on the mesa, and the fruit has all the requisites of a good commercial product, being particularly high in juice content and having a very thin rind. An outstanding feature of this fruit as grown on the mesa is its freedom from discoloration, which makes washing unnecessary. It has been noted that the lemon as grown in this locality tends to produce the greater portion of its crop in the fall—a time when the market demand is rather low. However, there should be no difficulty in holding the crop in storage through the winter, as is practiced in many of the older lemon districts, until early summer, when it could be marketed to advantage.

OTHER CROPS ADAPTED TO THE MESA.

In addition to or in combination with citrus fruits, the Yuma mesa offers ideal conditions for the commercial production of a number of other fruits, among the most important of which are dates, olives, grapes, and figs. Also, there are a number of truck crops that could be produced with profit.

Dates.—While the lower altitudes of the greater portion of southern Arizona are well adapted to date culture, the Yuma mesa presents special advantages in the growing of this fruit, particularly such varieties as the Deglet Noor that matures late in the season. With practical immunity from frost, together with relatively low humidity during harvest (under which conditions the date palm ripens its fruit to best advantage), afforded by this district, the Deglet Noor and kindred varieties could be allowed to remain on the trees until fully mature, becoming enriched in the highest degree in flavor and sugar content. The knowledge that this world-famous variety can be produced profitably only in specially favored regions lends interest to the fact that the Yuma mesa appears to possess the proper requisites for its successful culture. While the Deglet Noor variety is emphasized, this does not preclude the fact that many other varieties would succeed admirably well here. As proof sufficient that the date would thrive on the mesa, there are at present a number of old, neglected seedling trees along the roadside on the Blaisdell orchard that bear heavy crops.

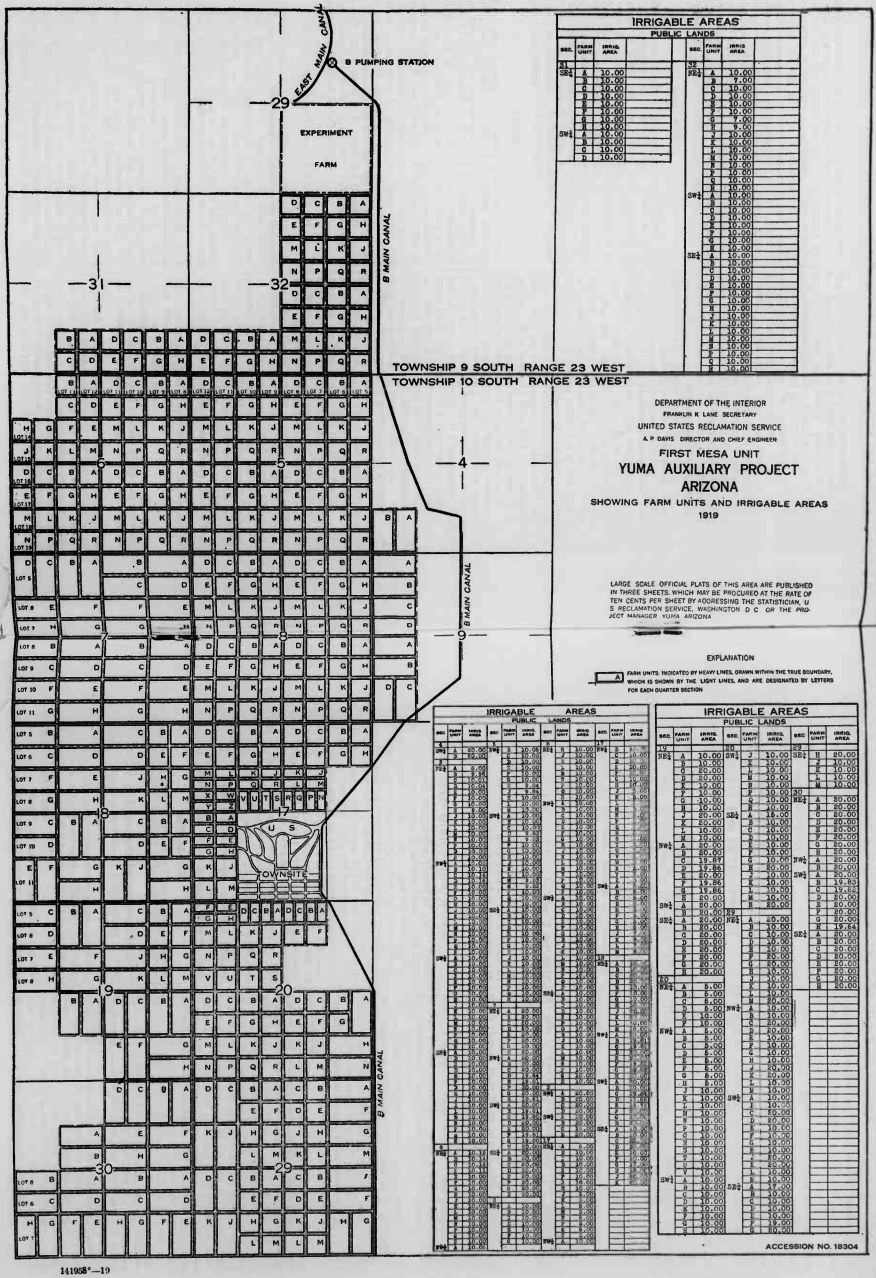
Olives.—The olive, like the date, is peculiarly adapted to arid conditions such as are found in the Southwest, and should receive favorable consideration as an adjunct planting on the mesa. Its value for both pickles and oil has become so well established that the demand for these products is permanently assured. With proper handling this fruit should yield profitable returns.

Grapes.—It is believed that the grape would give quicker returns on the mesa than any of the fruits, paying crops being produced the second year from planting. Furthermore, the grape can be relied upon to bear every year. Both the soil and the climate are conducive to the production of the highest quality European grapes. By planting early maturing varieties, such as the Thompson seedless, table grapes could be grown and placed on the market in advance of the bulk of the grape crop from the older commercial grape-growing centers, and as a consequence command the best prices. It is not only true that table grapes could be profitably grown here to advantage, but very excellent raisins could also be produced, as the absence of rain during the harvest season affords excellent opportunity for curing the raisin crop. Grapes have already been grown in a small way in this district, sufficiently to demonstrate that the mesa land will produce a vigorous growth of vine and heavy yields. The grape could be interplanted between rows of citrus with good results, but it is believed that it is of sufficient importance to warrant the making of special plantings.

Figs.—The mesa is particularly adapted to the production of the Smyrna or dried fig of commerce. To produce this fig of the finest quality, thinnest skin, and richest sugar content requires a hot, dry climate, such as is afforded by this region. Moreover, the climate is such that the little wasp (*Blastophaga Grossorum*), necessary for pollination of this type of fig, could be colonized permanently. Like the grape, the fig can be depended upon to produce a crop every year, and the fact that our importation of Smyrnas are constantly increasing, the annual amount averaging not far from 13,000 tons, is in itself sufficient indication of the possibilities of a great industry under the favorable conditions presented by this section. To successfully produce the dried fig it is not only necessary that a warm, practically frost-free climate be had, but there must be an absence of rain during harvest in order that the crop may be dried successfully, which condition is found here.

Evidence of the thrifty growth of figs on the mesa is shown by the condition of the 3-acre orchard of Adriatic figs now growing on the old Blaisdell ranch.

Truck crops.—The mild climate of the Yuma mesa affords an opportunity for the successful production of a number of the truck crops, particularly cantaloupes, tomatoes, and sweet potatoes. These crops are well adapted to growing between the rows of citrus trees while the orchards are young, and the fact that they could be produced excep-



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tionally early gives them a distinct market advantage. It might be mentioned that in the early years of the old citrus orchard on the mesa cantaloupes were grown between the rows of trees and were found quite profitable.

While the crops mentioned above appear to have an outstanding value as regards profitable production on the mesa, there are doubtless others that individual growers would find equally satisfactory.

CAPITAL FOR DEVELOPMENT.

[From report by Prof. Chas. F. Shaw, of the University of California.]

The development of the lands of the mesa will call for a considerable expenditure of money and effort before any returns can be expected. Ultimate success of ranching operations will depend on the successful building up of the soil during the first few years, and on the ability of the rancher to finance himself through those earlier years. Some returns might be secured through growing early vegetables between the tree rows, but this practice would tend to decrease the organic matter and hold back the building-up process. It would have to be practiced with restraint and with an intelligent understanding of the effects. The early maturity of such vegetables, coupled with the favorable transportation facilities of the area, might give a financial return that would warrant the practice. In general, however, it would be better to bend all the energies to the building up of the soil and the production of the major crop (the trees) and not endanger their success by intercropping.

PROPOSED IRRIGATION WORKS.

It is proposed to develop power at the "Siphon Drop" on the main canal, approximately 4½ miles north of Yuma; but since the funds for the construction of the power plant may not be immediately available, and in order to insure the prompt delivery of water, it is possible that power for the first one or two years' operations will be purchased at an approximate cost of 2 cents per kilowatt hour. The power will be carried on a high-tension transmission line to the pumping plant located on the proposed high line east main canal, which, with a lift of about 70 feet, will deliver water through a pressure pipe approximately 1,200 feet long to the highest point of the B unit of the mesa development. The distribution system on the mesa will consist of open canals (which eventually will be lined with concrete or other waterproofing material) and concrete pipe lines, with the necessary checks, bridges, turnout gates, measuring devices, etc., It is designed to deliver the water to each 40-acre tract.

SUMMARY.

[Extracts from reports by Prof. Chas. F. Shaw, of the University of California, and by members of the staff of the University of Arizona.]

The soils of the Yuma mesa have a desirable physical character and a moderately high fertility They are deficient in organic matter. With this deficiency supplied by plowing down cover crops they should prove very productive. The silt carried by the irrigation water will be beneficial in its effects on the soil condition.

The climate combines a small rainfall, a low relative humidity, and a great percentage of sunshine. This combination and its freedom from injurious frosts, make the Yuma mesa a most promising region for citrus culture.

The citrus fruit grown on the mesa is of excellent quality, and is as yet free from injurious citrus pests. In addition, the mesa is particularly well adapted to growing such other crops as dates, grapes, figs, and early truck. The probable cost of irrigation will be too high to permit the profitable production of the ordinary field crops.

The Yuma mesa, joining the main line of the Southern Pacific at Yuma, is insured efficient shipping facilities.

The rancher on the mesa must have sufficient capital to carry him through the first few years while the soil is being built up and the orchards developed.

Under irrigation the mesa should become an important and successful citrus-producing region.

STATEMENT OF SUCCESSFUL CITRUS ORCHARDIST.

YUMA, ARIZ., *September 1, 1919.*

The cost in time and money that attends the development of a citrus orchard may vary considerably with the individual, but I feel that the following figures are such as will produce results with which any person would be well satisfied.

In so far as I have been over the mesa lands I think that at least 60 to 70 per cent can be cleared and leveled for planting at from $5 to $15 per acre, but the balance I believe may be quite expensive, as mostly it appears to involve quite long hauls of dirt. A peculiar characteristic of the mesa seems to be that the land is either quite level or quite rough, but fortunately the rough part represents a very small proportion.

A permanent water-distributing system is essential, either a pipe line with suitable turnouts or valves at each tree row, or a cement flume. A 12-inch cement pipe irrigating system was recently installed on the mesa at a cost of less than 45 cents per foot. Irrigation can be made from open dirt ditches but this method is neither efficient nor economical.

In preparing the land for planting there are many individual notions, such as blasting the tree holes, which even in light land is thought by many to be good practice; thorough and deep plowing or subsoiling; and a thorough irrigation or two. The cost of planting amounts to 10 to 15 cents per tree and the tree itself generally sells for about $1 and seldom over $1.50, depending, of course, on supply and demand. The usual planting is 90 trees per acre.

Once that the orchard is planted I feel that the following items of expense will meet the conditions in a very satisfactory way: Labor, teamwork and hand, $40 per acre per year; water at $10 per acre per year, which, I understand, will be about the cost, and if so will be very cheap water; fertilizer at $20 per acre; and $20 per acre for incidentals, making a total of $90 per acre per year. It is not necessary here to include that other very expensive item that is so essential all over California—namely, fumigation—as at present we have no injurious insect pests, and we will undoubtedly remain free so long as the present rigid quarantine laws are enforced. This is a matter of vital importance to the industry, and no effort should be spared to maintain this very satisfactory condition.

Young orchards are frequently intercropped, and these crops often show a considerable net return per acre, which may materially reduce the cost of orchards' care, but I strongly feel that the growing of any intercrop other than a legume is a very short-sighted policy, as it is undoubtedly done at the expense of the tree.

I believe that conditions here make it possible to produce a tree in three years that will be capable of carrying upward to a box of fruit, and at eight years it is conservative to expect a tree to produce three packed boxes. It is a matter of record that this fruit offered on the holiday market will bring more than $3 per box. It seems perfectly safe to say that where proper cover-crop methods are followed that production here will be heavier and more consistent than elsewhere, as this principle has already been well demonstrated.

There will undoubtedly be better practices developed than we know anything about at present, but I am now thoroughly convinced that no peculiar difficulties attend the development of orchards on the mesa; and so far as we have gone we will be pleased to tell whatever we may know to any interested person.

Yours, truly,
(Signed) GEORGE M. HILL

STATEMENT OF SUCCESSFUL NURSERYMAN.

SAN DIMAS, CALIF., *August 25, 1919.*

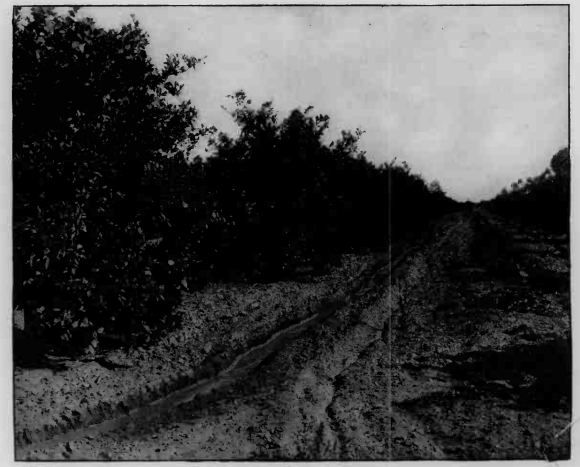
I first visited Yuma about two years ago last spring, and from what information I could gather at that time was immediately impressed with the desirability of the Yuma mesa for the growing of citrus fruits. In the spring of 1918 I started a small citrus nursery there and am more than pleased with the results obtained to date. I have been connected with the growing of citrus nursery trees as well as orchards for a number of years here in California, and can say that the Yuma mesa appeals to me strongly as a citrus proposition, owing to its being free from intense cold, its cheapness of water, easy accessibility to fertilizer, freedom from injurious insect pests, and last, but not least, the early ripening of the fruit, which puts it in the eastern markets when they are practically bare of competitive fruit from other States, thereby commanding top prices.

I am fully confident that the Yuma mesa has a great future in the production of citrus fruits, as well as other crops adapted to that climate.

Yours, very truly,
(Signed) R. W. TEAGUE.

H. W. Blaisdell, of Los Angeles, Calif., owner of the Blaisdell orchard on the Mesa, states as follows:

The older trees in my orchard were set out some 25 years ago, and their growth and rich foliage prove what the soil, water, and climate will do. We have never lost an orange from frost during the life of the orchard, which can scarcely be said of any other orange-growing section in the United States. The navel oranges ripen early and are of such good quality that we market our entire crop in Los Angeles in November. The grapefruit also ripens early, and the quality is so fine that most of the crop is shipped on special orders at a high price. Our exhibit of oranges and grapefruit received a gold medal at the St. Louis Exposition. An orange yield of $300 or $400 per acre may be relied upon from orange trees in full bearing.



Tree gating orange grove on Yuma mesa.

PUBLIC NOTICE AND REGULATIONS.

(Under Act Jan. 25, 1917, 39 Stat., 868, and Act Feb. 11, 1918, 40 Stat., 437.)

YUMA AUXILIARY PROJECT, ARIZONA.

FIRST MESA UNIT.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., October 3, 1919.

1. **Lands set apart as First Mesa Unit.**—There are hereby set apart as the First Mesa Unit of the Yuma Auxiliary Project, Arizona, the unentered public lands shown on township plats of townships 9 and 10 south, range 23 west, G. and S. R. B. and M., approved on the date above given. Said plats are on file in the office of the project manager, United States Reclamation Service, at Yuma, Ariz., and in the local land office at Phoenix, Ariz.

2. **Value of land and water charges against same.**—The reasonable value per acre of said lands so set apart is hereby fixed and determined to be $25 per acre. The estimated cost of reclamation works hereafter to be constructed for the reclamation of said lands is hereby fixed and determined to be $160 per irrigable acre. The proportionate cost of the reclamation works previously constructed for said Yuma project and available for said lands, is hereby fixed and determined to be $40 per irrigable acre. Said lands are subject to the payment of all of the above stated sums, and in addition an amount per irrigable acre sufficient to return to the United States the total actual cost of the works of said First Mesa Unit in the event that the actual cost of said works shall exceed the estimated cost thereof. Said lands are also subject to an annual charge, announced from time to time by the Secretary of the Interior, to cover the cost of operating and maintaining the irrigation works, which charge shall be paid each year in advance of the delivery of water.

3. **Sale of lands.**—Said unentered public lands shown on said plats will be sold at public sale to the highest bidder therefor, at Sunset Park in the city of Yuma, Ariz., on December 10, 1919, from 10 o'clock a. m. until noon and from 1 o'clock until 3 o'clock p. m. of that day, and each day thereafter, excluding Sunday, until all of said lands have been offered for sale: *Provided*, That no bid will be received for less than the value of the total area of the tract bid upon and the amount of the water charges against the irrigable area of the tract, as stated in paragraph two above: *Provided further*, That no person shall be permitted to purchase more than a total of 40 acres at said sale.

4. **Terms of purchase.**—Each successful bidder at the public sale will be required to execute at once, in duplicate, a land and water right application as hereinafter provided, and at the same time make a deposit in cash, or by money order, certified check or draft of 10 per centum of the amount bid for the land and water right proposed to be purchased. Upon notice from the Secretary of the Interior that such bid has been accepted, the bidder shall be required to pay 15 per centum additional within 60 days after the date of such notice. In case of failure so to do the deposit shall be forfeited, the land and water right application shall be canceled, and the land and water right in question shall be available for further sale. The remaining 75 per centum

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DEPARTMENT OF THE INTERIOR,
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of the purchase price shall be paid in three annual installments, with interest at the rate of 6 per centum per annum on deferred payments until paid, running from the date of notice to pay the additional 15 per centum. Advance payments, however, may be made at any time. Upon full payment of the purchase price patent will issue for the land, which patent will contain a grant of the water right appurtenant to the land: *Provided*, That to each installment of the sale price of the land independent of the water right, there must be added and paid by the purchaser 2 per centum thereof, being the legal fees of the Register and Receiver of the local land office: *Provided further*, That in case the bids for the land and water rights shall not aggregate a sufficient amount within six months from the date of sale to meet the probable cost as announced herein all deposits will be returned and all land and water right applications canceled.

5. **Land and water right applications.**—Each successful bidder at the time of depositing 10 per centum of the sale price, must deliver to said project manager a land and water right application executed in duplicate, for the land and water right proposed to be purchased, upon the form annexed hereto, marked Exhibit A. One of these applications will be filed with the United States Reclamation Service, and the other in the said local land office.

6. **Blank forms and farm unit plats.**—The project manager, United States Reclamation Service, Yuma, Ariz., will furnish, upon application by those interested, blank forms of said land and water right application, without charge, and copies of said farm unit plats, which consists of three sheets, at the price of 10 cents per sheet.

7. **Qualifications of purchasers of public land.**—No qualification or limitation shall be required of any purchaser or patentee of public land except that he be a citizen of the United States. A corporation can not become a purchaser of public land at the sale. A purchaser is not required to live on or in the neighborhood of the land purchased. One who now holds lands under a Federal irrigation project is not barred from becoming a purchaser hereunder.

8. **Preference rights.**—Any person who has made an entry which is now valid and subsisting or who has a preference right to make entry for any of the lands shown on the said plats may purchase said land at the price of $2.50 per acre and shall be subject to the same payments for the irrigation works as are required of persons holding private lands, as hereinafter stated. Entries under preference rights shall be made at said local land office at Phoenix, Ariz., on or before December 1, 1919.

9. **Construction of works.**—The construction of the irrigation system of the First Mesa Unit is dependent upon securing the necessary funds therefor from the sale of lands and water rights hereunder. If the bids received within six months aggregate a sufficient amount to justify the building of said system, construction work will be promptly begun and diligently prosecuted to completion as rapidly as the incoming payments will permit.

FRANKLIN K. LANE,
Secretary of the Interior.

Form A-7-272 Yuma Mesa.
(Oct. 1919.)

Serial No. .....
Filed .....

LAND AND WATER RIGHT APPLICATION.

(Act January 25, 1917, 39 Stat., 868, as amended.)

YUMA AUXILIARY PROJECT, ARIZONA.

FIRST MESA UNIT.

....., 19....
Date

I, ... (Post-office address: .....),

under the above-mentioned act and the regulations thereunder, for value received, for myself, and for my heirs, executors, administrators, and assigns, do hereby agree as follows:

(*a*) I will purchase from the United States ..... acres of land in the First Mesa Unit, Yuma Auxiliary Project, Arizona, described on township plats approved by the Secretary of the Interior on October 3, 1919, as farm unit ....., section ....., township ..... south, range 23 west, G. & S. R. B. & M., containing ..... acres of irrigable land; together with a water right for the irrigation of and to be appurtenant to said irrigable area.

(*b*) I will pay for said land the sum of $..... and for said water right the sum of $....., as follows: Ten per centum thereof on the date of this agreement; 15 per centum thereof within 60 days from date of notice of acceptance of my bid evidenced by this application; and the remaining 75 per centum in three annual installments beginning one year after date of notice of acceptance of my said bid; together with interest at the rate of 6 per centum per annum on deferred payments, and the legal fees of the register and receiver of the local land office; also I will pay, in addition thereto and in advance of the delivery of water, the annual charges for operation and maintenance as announced by the Secretary of the Interior.

(*c*) In case the actual cost of the irrigation works of said First Mesa Unit shall exceed the sum of $200 per irrigable acre, I agree to pay my proportionate share of the actual cost of the works.

(*d*) The measure of the water right for said land is that quantity of water which shall be beneficially used for the irrigation thereof, but in no case exceeding the share, proportionate to irrigable acreage, of the water supply actually available as determined by the project manager or other proper officer of the United States, or of its successors in the control of the project, during the irrigation season for the irrigation of lands under said unit. If measuring devices are not installed at the land the amount of water delivered shall be determined by the Reclamation Service official in charge of the project, a reasonable allowance being made for losses of water after passing the point of measurement.

(*e*) The United States and its successors in charge of the said unit shall have full control over all ditches, gates, and other structures owned or controlled by me or my successors in interest and which are required to deliver water hereunder; and proper officers and employees of the United States and its successors shall have at all times the right of access to the above-described premises whenever it is, in the judgment of the officer or employee in charge of said unit, necessary for them in the discharge of their duties of distributing water to exercise said control.

(*f*) The United States reserves the right upon my failure or the failure of my successors in interest to keep and perform any of the provisions in this instrument contained, by me and my successors in interest undertaken to be kept and performed, to refuse to deliver water to said land or to stop the delivery of water thereto if water is being delivered, and such refusal to deliver or stoppage of delivery of water shall not operate to cancel this application, but shall be considered as an additional remedy to the United States to any remedies existing by reason of the provisions of this application or otherwise.

(*g*) This application is subject to the condition that in case the bids received by the United States for the lands of said First Mesa Unit shall not aggregate a sufficient amount within six months from the date hereof to meet the probable cost of the works of said First Mesa Unit as stated in paragraph 2 of the Public Notice and Regulations approved October 3, 1919, all payments made hereunder will be returned to me and this application will be canceled; also to the further condition that the irrigation works for said land can not be built until the money therefor is received from the sale of said lands and water rights.

(*h*) No Member of or Delegate to Congress, or Resident Commissioner, after his election or appointment or either before or after he has qualified and during his continuance in office, shall be admitted to any share or part of this contract or agreement, or to any benefit to arise thereupon, nothing, however, herein contained shall be construed to extend to any incorporated company, where such contract or agreement is made for the general benefit of such corporation or company, as provided in section 116 of the act of Congress approved March 4, 1909 (35 Stat., 1109).

IN WITNESS WHEREOF, I have hereunto set my hand and seal on the day and year first above written.

..... [L. S.]

ACKNOWLEDGMENT.

State of .....
County of ..... } ss.

On this ..... day of ....., 19...., before me personally came .....
....., to me known to be the individual.. described in and who executed the foregoing instrument and ..he.. acknowledged to me that ..he.. executed the same.

....., *Notary Public.*

My commission expires .....

AFFIDAVIT OF CITIZENSHIP.

State of .....
County of ..... } ss.

..... being first duly sworn, says that he is the person who signed the above instrument, and that he is a .....
(Applicant must state whether he is native born or naturalized.

.....
If not native born, record evidence of citizenship will be required before patent will issue.)
citizen of the United States of America.

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Sworn to before me this ..... day of ....., 19.....

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ACCEPTANCE.

Accepted this ..... day of ....., 19...., by authority of the Secretary of the Interior.

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Project Manager, U. S. R. S.

CERTIFICATE OF REGISTER.

UNITED STATES LAND OFFICE AT PHOENIX, ARIZ.,

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I hereby certify that the records of this office disclose no objection to the foregoing application.

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Register.

Road through citrus groves on Yuma Mesa.

Five-year old pecan orchard on Yuma project.

Cotton field in Yuma Valley.

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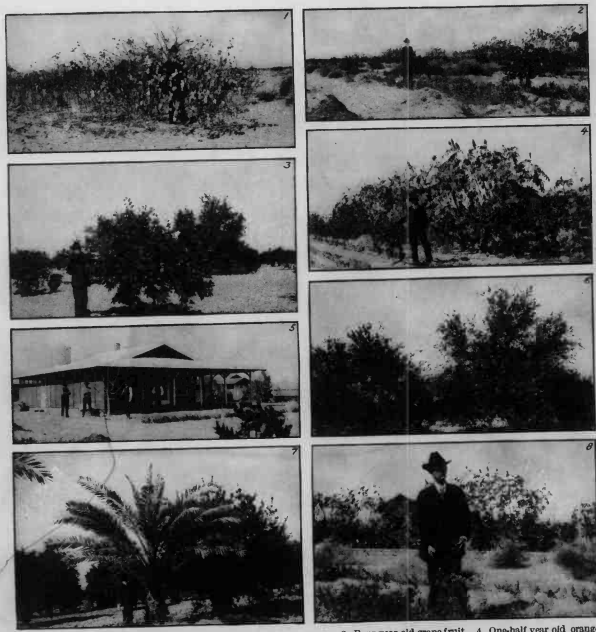
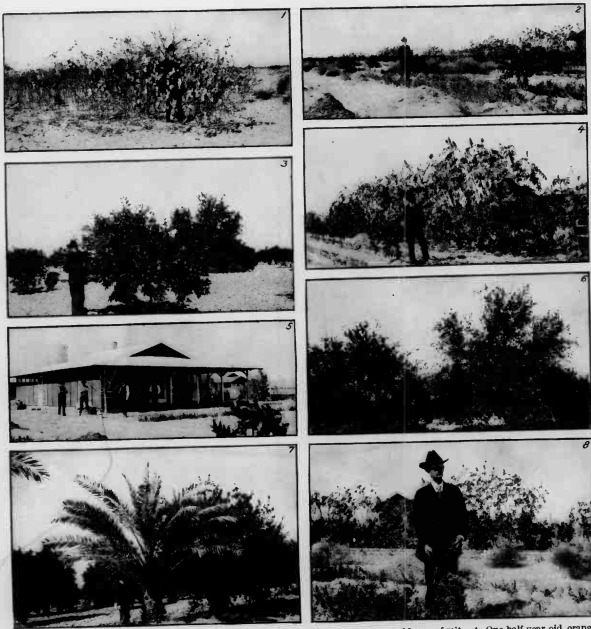


1 Long-staple Egyptian cotton, Feb. 10, 1918. 2. Young orange grove. 3. Four-year old grape fruit. 4. One-half year old orange trees; castor beans in background. 5. Residence of Mr. Hill on 20-acre young orange grove. 6. Lemon tree, which produced 25 boxes of choice lemons. 7. Orange grove and date palm. 8. Young orange grove with volunteer alfalfa.

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1919



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END OF
TITLE